



THE ORTHOPAEDIC TREATMENT OF HAEMOPHILIC ARTHROPATHY IN PATIENTS WITH INHIBITORS:

A 15-YEAR EXPERIENCE AT A SINGLE INSTITUTION

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INTRODUCTION AND OBJECTIVE

Development of inhibitors is one of the most serious complications of Haemophilia, inducing poor efficacy of the haematologic treatment, recurrency of bleedings, and generally more severe arthropathies with respect to non-inhibitors subjects. Orthopaedic surgery in such subjects have been considered at high risk for complications, and often discouraged for decades. Thus, the quality of life of such patients has been reported as lower than other haemophiliacs. Since the introduction of bypassing agents and recombinant activated FVII, clinical settings have improved, and indications for orthopaedic surgery widened with acceptable rates of complications.

The aim of this study is to determine the safety of several orthopaedic procedures in haemophiliacs with inhibitors managed by the use of recombinant activated VII agents in a 15-years experience.

MATERIALS AND METHODS

From 2000 to 2015 thirty-four surgical procedures and sixty-five injections have been performed respectively in 15 and 12 haemophiliacs with inhibitors at our Institution.

Criteria for injections were: patients of all ages; symptomatic joints with mild to moderate arthropathy without severe deformity; tendency to bleed and/or to recurrent pain crisis; poor outcomes by medical treatment and physical therapy. Hyaluronic acid injections (*viscosupplementation*) were indicated in cases of symptoms not associated to highly intense synovitis (detected by US examination). Yearly cycles of 3 to 6 injections were performed with a monthly interval in knees, elbows, and ankles. Rifampicine injections (*chemical synoviorthesis*) were proposed in symptomatic subjects with US assessment of highly active synovitis and recurrent bleedings despite a bleeding prophylaxis. Two or three injections were performed with a monthly interval in knees, elbows, and ankles.

Criteria for a surgical procedure were: symptomatic arthropathy associated with severe deformity with high tendency to bleed and without poor relief after medical therapy or injections.

All patients were treated with 2-3 doses of rFVIIa (90-120 mcg/kg) every two hours during surgery up to the wound suture, followed by continuous infusion of rFVIIa at dose of 30-50 mcg/kg/h on postoperative days 1 to 3 and 15 mcg/kg/h on days 4 to 14. Plasma levels of FVII:C were maintained >15 U/mL.

Results were evaluated by Haemophilia Joint Health Score (HJHS) and specific scores in case of knee arthroplasty (Knee Society Score – KSS).

RESULTS

Forty-nine injections with hyaluronic acid and 16 with rifampicine were performed in various target joints of 12 symptomatic patients between 2000 and 2014 (Table 1). Good outcomes were reported by all patients, without any complications. All scores showed improvements after injections. In three patients (two knees, one ankle) the persistency of bleedings and symptoms after viscosupplementation lead to the injection of rifampicine, and to an ankle arthroscopy. Most of patients underwent cycles of injections with a one to two year intervals.

The following were the surgical procedures performed in 15 patients between 2001 and 2014: 14 Total Knee Arthroplasties (TKA); 4 revision TKAs; 4 revisions of Total Hip Arthroplasty; 3 manipulations under anaesthesia; 1 radial head resection; 3 ankle fusions; 1 hardware removal of a previous hip fracture; 1 wrist ORIF for an acute fracture; 1 neurolysis for carpal tunnel syndrome; and 2 ankle arthroscopies (Table 2).

It should be noted that most of such patients underwent several injections or surgeries their various target joints.

We achieved satisfactory outcomes in all patients, recording the following complications: 3 cases of postoperative bleedings after TKA (managed by increased doses of activated FVII concentrate); 1 case of pulmonary embolism (managed by intensive care treatment); and 1 case of scar dehiscence managed by surgical revision and vacuum therapy. Five subjects needed blood transfusions after joint replacement. No significant delays in the rehabilitative period were recorded in the complicated cases. No adverse reactions or complications were reported for patients treated by injections. All scores improved as reported in Table 3.

TABLE 1 Injections		
Age	7-67 y	
HCV	6	
HCV + HIV	2	
N° of joints treated		
	Viscosupplementation	Chemical synoviorthesis
Shoulder	1	-
Elbow	1	1
Knee	9	4
Ankle	8	-

TABLE 2 Surgical procedures	
Age	11-59 y
HCV	9
HCV + HIV	2
TKA	14
Revision TKA	4
Revision THA	4
Manipulation under anaesthesia	3
Radial head resection	1
Wrist ORIF	1
Ankle Arthroscopy	2
Neurolysis	1
Hardware removal	1
Ankle Fusion	3

TABLE 3 Results	HJHS pre	HJHS post
Viscosupplementation	10.83	7.88
Chemical synoviorthesis	9.33	2.67
Total Knee Arthroplasty	14.2	5.6
	KSS preop: 18.4	KSS postop: 90.0
Ankle arthroscopy	10.5	8.5
Ankle fusion	14	10

DISCUSSION

The orthopaedic management of haemophilic arthropathy in patients with inhibitors represented and to date represents a challenge. Major surgery is effective but associated with high rates of complications and shorter survivorships (in cases of joint replacement) with respect to the other haemophiliacs. Thus, few series of haemophilic subjects with inhibitors undergoing minor or major orthopaedic treatments have been reported during last decades. Conservative strategies have seldom reported as effective in such patients, prone to recurrent bleedings despite their close adherence to the haematologic prophylaxis. Moreover, little experiences with surgical procedures were reported due to the high risks of postoperative sequelae.

In our experience, injections with proper indications ensured satisfactory outcomes and a delay of major surgery. On the other hand, several surgical procedures were performed with good results and without severe complications except a non-fatal pulmonary embolism. Dedicated teams are able to ensure safe treatments and satisfaction from inhibitors patients.

CONCLUSIONS

Haemophiliacs with inhibitors may safely undergo surgical and minimally invasive orthopaedic treatments in centers with dedicated multidisciplinary teams. To date, our experience has to be considered the most consistent in such patients.

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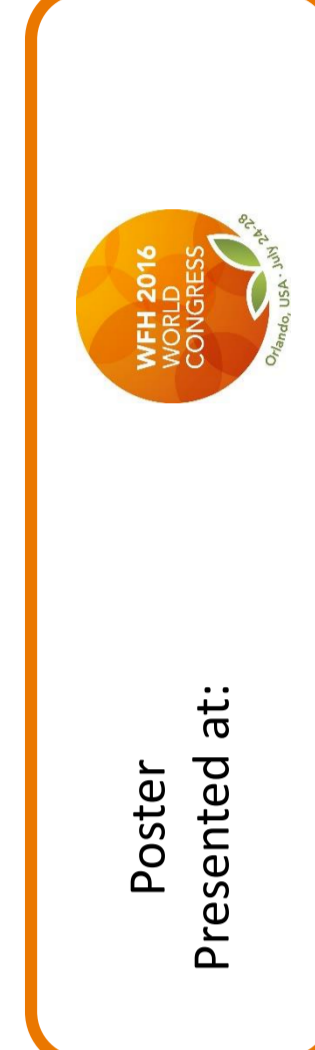
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Comorbidity
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